Section 4 — Electron Mathematics

This section documents the complete FUNt mathematical description of the electron. The electron is treated not as a point particle, but as a buoyant magnetic-phase node within the φ–ψ harmonic lattice. All electron behavior — drift, buoyancy, tunneling, coupling, and photon-like modes — emerges from its position on the Dual-Decad φ^n ladder.

4.1 Electron as Magnetic-Phase Node

• Electron occupies φ^0 ground-localized mode in hydrogen (H = 0 rule).

• All higher modes arise from φ-based magnetic buoyancy.

• Buoyancy counteracts lattice strain from protonic mass.

• [Insert visual diagram here]

4.2 Drift-Current Law

• Electron drift velocity emerges naturally in φ^1–φ^2 bands.

• These bands correspond to the initial Hall-coupled flow states.

• Current ≈ charge density × drift velocity (FUNt reinterprets v as φ-phase drift).

• [Insert visual diagram here]

4.3 Diamagnetic Buoyancy (ϕ^2 Mode)

• Electron resists field compression.

• Diamagnetism arises from φ^2 stability valley.

• Aligns with FUNt buoyancy model: $F_{mag} \approx (\chi/2\mu_0)\nabla B^2$.

• [Insert visual diagram here]

4.4 Dual-Decad Electron Rung Map

• φ^0 = localized electron state.

• φ^1 = onset of drift motion.

• φ^2 = diamagnetic buoyancy.

• φ^3 = Hall coupling.

• φ^4 = spin-torque transfer.

• φ^5 = tunneling entry.

• φ^6 = superconductive pairing.

- φ^7 = photon-like electron.
- φ^8 = bi-photon entanglement.
- φ^9 = scalar-field transport.
- [Insert visual diagram here]

4.5 Electron Tunneling Conditions

- $T \approx \exp(-2kd)$ with φ^5–φ^6 threshold.
- Better φ^7 phase match → higher tunneling probability.
- Tunneling interpreted as φ-phase resonance alignment, not randomness.
- [Insert visual diagram here]

4.6 Photon-Like Electron (ϕ^7 Mode)

- Electron behaves like a low-bound-density photon.
- Occurs at φ^7 coherence threshold (same for decay coupling).
- Matches Volume-10 tunneling resonance windows.
- [Insert visual diagram here]

4.7 Bi-Photon Entanglement (ϕ^8 Mode)

- Electron exhibits dual-photon behavior.
- Entanglement is resonance locking in φ^8 inversion band.
- Matches Nucleon Decad theory.
- [Insert visual diagram here]

4.8 Scalar-Field Transport (ϕ^9 Mode)

- Highest electron mode prior to lattice reset.
- Electron becomes near-zero-mass transport node.
- This allows scalar-womb recursion echoes.
- [Insert visual diagram here]